Trend Study 16B-20-99

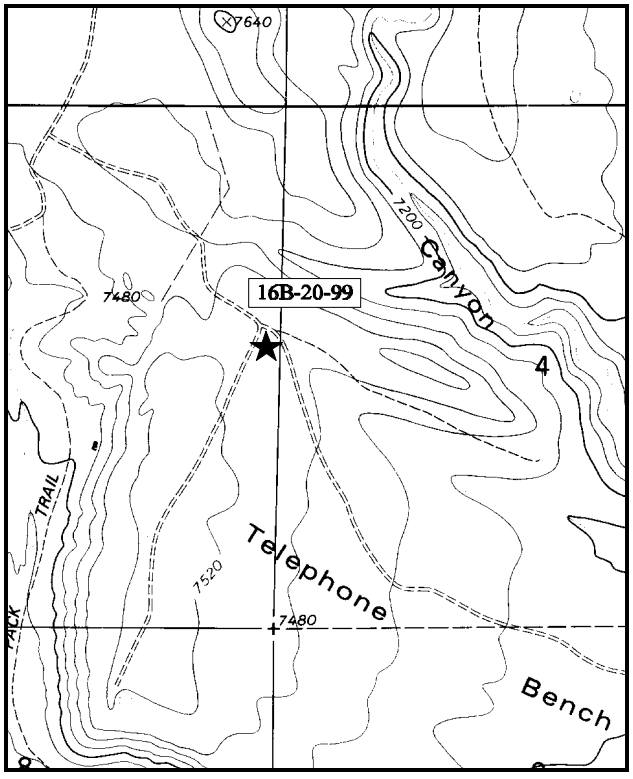
Study site name: Telephone Bench . Range type: Big Sagebrush - Grass .

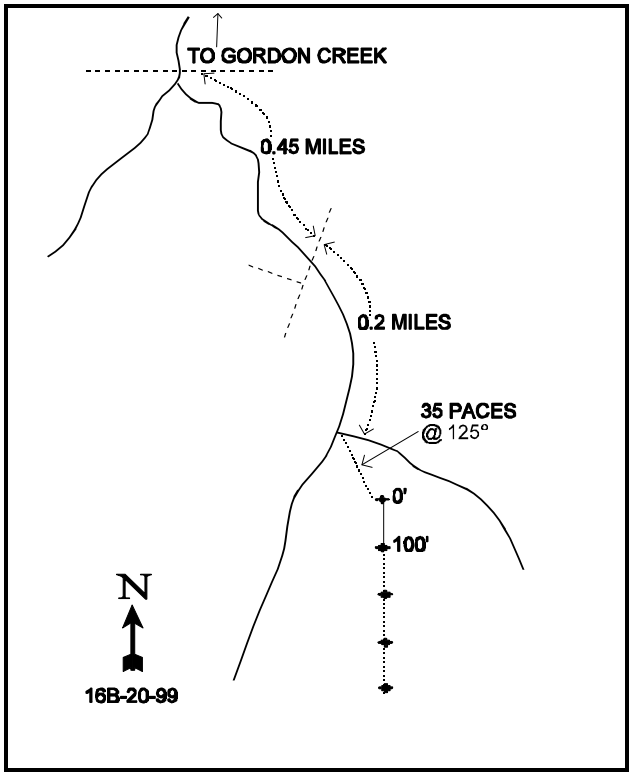
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the intersection of US 6 and the Consumers Road south of Helper, go 3.5 miles to a railroad crossing. Continue up the oiled road 6.0 miles. Turn left onto a dirt road, cross Gordon Creek and proceed approximately 2.3 miles to a cattleguard. Go 1.2 miles to a wire fence. Just beyond the fence, turn left at the fork and go 0.45 miles to another fence. Continue on 0.2 miles to a fork at the top of the hill. The study site is between the forks. The 0-foot baseline stake is 35 paces southeast of fork. The study is marked by cut green fenceposts about 18" tall.





Map Name: Jump Creek Diagrammatic Sketch

Township 14S ,Range 8E , Section 5 UTM 4387379.745 N, 496438.981 E

DISCUSSION

Trend Study No. 16B-20 (30-6)

The Telephone Bench is on Division owned winter range located on Telephone Bench, southwest of Price. This study samples a big sagebrush/grass type on the northern end of Telephone Bench. At one time, the area was heavily grazed by cattle, but currently no livestock grazing is permitted. Data from a nearby pellet group transect indicates widely fluctuating deer use. During the 1990-91 winter, 125 deer days use/hectare were estimated. This number dropped to only 12 ddu/ha in 1992-93. During the winter of 1994-95, there was an estimated 42 ddu/ha. The 1999 pellet transect data read on the study area indicated light to moderate use by deer, but high use by elk. Deer use was estimated at 19 days use/acre (48 ddu/ha), and elk use at 72 days use/acre (179 edu/ha). One cattle pat was sampled during 1999.

On top of the bench, the elevation is 7,360 feet. The land faces east-northeast with an average slope of 5%. Compared to other deer winter range sites studied in the area, the higher elevation at this site affords more precipitation resulting in the presence of mountain big sagebrush intermixed with black sagebrush. The soil is somewhat shallow as black sagebrush predominates (estimated effective rooting depth of 11 inches), but there are some deeper areas allowing mountain big sagebrush to occur. The soil is a dense clay loam with a slightly alkaline pH (7.4). Phosphorus is low at 5.7 ppm where 10 ppm has been shown necessary for normal plant growth and development. There is moderate localized erosion on the site with some pedestaling noted around the base of the shrubs. Litter cover substantially decreased in 1999 which could cause increased erosion in the future, especially during severe thunderstorms.

The most abundant shrub on the site is black sagebrush which had a density of 6,932 plants/acre in 1988 and 6,680 in 1994. The current density is estimated at 6,840 plants/acre, with 70% of the population classified as mature. Further age class analysis indicates the potential for this species to expand with a high biotic potential (21%) and recruitment from young plants (16%). Percent decadency substantially decreased from 55% in 1994 to 15% in 1999. Apparently, many of the plants classified as decadent in 1994 regained their vigor and were classified as mature plants with normal vigor in 1999. The proportion of the population displaying poor vigor decreased from 34% in 1994, to 3% in 1999. The drought conditions probably accounted for a lot of the high decadency and poor vigor of black sage during the 1994 reading. It appears that more normal precipitation patterns in the past few years have reversed the downward trends for black sagebrush.

Mountain big sagebrush currently has a low population density on this site. There were only 466 plants/acre in 1988, and 180 by 1994. The population is currently estimated at 360 plants/acre. The available mature shrubs were heavily hedged in 1988, mostly moderately utilized in 1994, with heavy use increasing to 28% in 1999. Poor vigor was displayed on 11% of the population in both 1994 and 1999. Seed production has been low with few seedlings encountered in 1994, however, seedlings were estimated at 120 plants/acre in 1999. This is likely a marginal site for big sagebrush due to soil conditions, and when coupled with drought, has caused a decline in population density. Improved precipitation should help to increase reproduction for mountain big sagebrush in the future. There are a few scattered serviceberry on the site which receive moderate to heavy use. The height and crown diameter for serviceberry dropped significantly in 1999 on this marginal site. Dwarf rabbitbrush and broom snakeweed are very abundant, currently estimated at 6,260 plants/acre and 5,940 plants/acre respectively. These species appear to have stabile populations as over 90% of their populations are classified as mature. Use is mostly light on both.

Grasses are the dominate type as they provide over half of the total vegetative cover in both 1994 and 1999. Identification of grasses in past readings resulted in several species being “lumped” together including: bluebunch and slender wheatgrass, and mutton and Sandberg bluegrass. These species were separated in the 1999 reading. Slender wheatgrass was the most prominent species accounting for 55% of the grass cover in 1994. This species is actually much less abundant, with bluebunch wheatgrass being the dominant species

after they were separated in 1999. Bluebunch wheatgrass currently provides 60% of the grass cover and 32% of the total vegetative cover. Mutton bluegrass, which also was very abundant in past readings greatly decreased due to the splitting of this species with Sandberg bluegrass. Currently, Sandberg bluegrass is the second most abundant species in nested and quadrat frequency. Salina wildrye is also present and provides 19% of the grass cover in 1999. Grasses are vigorous, with mutton bluegrass showing some utilization. Forbs are diverse, with many species being moderately frequent, however no one species is particularly dominant. Twenty perennial forbs were sampled in 1999.

1994 TREND ASSESSMENT

Ground cover characteristics have remained basically stable since the last reading. The abundant herbaceous ground cover and litter cover adequately protect the soil on the site. Due in part to drought conditions, mountain big sagebrush and serviceberry are not doing well on this marginal site. Black sagebrush, the key browse species, is also suffering the effects of drought. It has a stable population density at the present time, however percent decadency has increased (from 45 to 55%), coupled with the reduced vigor (those with poor vigor have gone from 10 to 34%), there has also been an increase in percentage of decadent plants classified as dying (from 9 to 50%). All of these downward indicators indicate a decline in population density in the future if current drought conditions persist. These factors, and the abundance of increaser rabbitbrush and broom snakeweed, combine to cause a slightly downward browse trend on this site. Like many of the sites on this unit, the herbaceous understory trend is mixed. Sum of nested frequency for grasses increased 66% while those of forbs declined 63%. Combined nested frequencies of grasses and forbs combined remained fairly stable indicating a stable trend.

TREND ASSESSMENT
soil - stable
browse - slightly down
herbaceous understory - stable overall, up for grasses and down for forbs

1999 TREND ASSESSMENT

Trend for soil is stable. While percent litter substantially decreased, vegetative cover increased, and bare ground decreased. Herbaceous vegetation provides 64% of the vegetation cover at the site with most of this coming from perennial species which are good at holding soils in place. Evidence of erosion is slight at the present time, although it could increase in the future with a continuing decline in litter cover. Trend for browse is slightly up. Many of the browse parameters measured showed a declining trend 5 years ago due to drought. With better moisture in the past few years, these parameters currently are showing improvement. Percent decadency for black sagebrush has declined from 55% to 15%, with many of the decadent plants regaining their vigor and being classified as mature with normal vigor in 1999. Biotic potential and recruitment are high, increasing to 21% and 16% respectively. Use has increased however, with 40% of the population showing moderate use. Mountain big sagebrush is not particularly abundant, although density increased in 1999, and biotic potential is currently high at 33%. Percent decadency also decreased from 33% in 1994 to 17% in 1999. One negative aspect is the abundance of broom snakeweed. Trend for the herbaceous understory is stable. Although sum of nested frequency for perennial species declined as a whole, perennial grass nested frequency increased. Since grasses make up over half of the total vegetative cover at the site, trend is stable for herbaceous species.

TREND ASSESSMENT
soil - stable
browse - slightly up
herbaceous understory - stable

HERBACEOUS TRENDS --
Herd unit 16B, Study no: 20

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'94	'99	'88	'94	'99	'94	'99
G	Agropyron spicatum	a-	a-	b239	-	-	79	-	12.92
G	Agropyron trachycaulum	b265	b238	a72	90	79	27	8.94	.72
G	Bouteloua gracilis	15	13	22	5	4	10	.48	.46
G	Elymus salina	a-	b65	b78	-	24	31	2.37	4.17
G	Koeleria cristata	-	3	3	-	2	1	.01	.03
G	Oryzopsis hymenoides	-	3	3	-	1	1	.00	.00
G	Poa fendleriana	b95	c250	a36	45	91	18	4.42	.41
G	Poa secunda	a-	a-	b156	-	-	67	-	2.30
G	Sitanion hystrix	16	26	22	8	12	11	.13	.44
G	Stipa comata	4	-	-	2	-	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		395	598	631	150	213	245	16.36	21.48
Total for Grasses		395	598	631	150	213	245	16.36	21.48
F	Agoseris glauca	a-	a-	b5	-	-	3	-	.04
F	Antennaria rosea	b59	b46	a15	27	19	8	.90	.26
F	Arabis spp.	8	2	4	4	1	2	.00	.01
F	Astragalus convallarius	b91	a40	a52	42	18	24	.14	.77
F	Astragalus tenellus	10	1	9	4	1	7	.00	.64
F	Balsamorhiza hookeri	b22	a-	a-	11	-	-	-	-
F	Castilleja chromosa	b137	a21	a29	62	13	14	.06	.19
F	Calochortus nuttallii	-	4	3	-	2	1	.01	.00
F	Comandra pallida	20	24	31	7	10	11	.15	.37
F	Collinsia parviflora (a)	-	3	-	-	1	-	.00	-
F	Crepis acuminata	a2	b36	a1	1	19	1	.26	.03
F	Descurainia pinnata (a)	-	3	1	-	1	1	.00	.03
F	Erigeron eatonii	b64	a37	a15	32	18	7	.19	.04
F	Eriogonum jamesii	11	12	10	7	5	5	.34	.24
F	Gilia spp. (a)	-	4	-	-	2	-	.01	-
F	Hymenoxys acaulis	10	-	4	5	-	2	-	.06
F	Lappula occidentalis (a)	-	3	-	-	1	-	.00	-
F	Lesquerella spp.	a20	ab47	b63	10	21	27	.10	.48
F	Lomatium spp.	-	6	1	-	3	1	.01	.03
F	Machaeranthera grindelioides	26	11	15	10	6	6	.03	.39
F	Paronychia sessiliflora	b10	a-	a-	4	-	-	-	-
F	Penstemon watsonii	45	38	50	22	21	22	.10	.79
F	Phlox longifolia	c175	b119	a8	72	54	3	.27	.01
F	Polygonum douglasii (a)	-	2	-	-	1	-	.00	-
F	Senecio multilobatus	2	-	5	2	-	2	-	.01

Type	Species	Nested Frequency '88	Nested Frequency '94	Nested Frequency '99	Quadrat Frequency '88	Quadrat Frequency '94	Quadrat Frequency '99	Average Cover % '94	Average Cover % '99
F	Sphaeralcea coccinea	$_{a}$1	$_{ab}$5	$_{b}$20	1	3	8	.06	.09
F	Trifolium gymnocarpon	30	16	3	18	8	1	.04	.00
Total for Annual Forbs		0	15	1	0	6	1	0.02	0.03
Total for Perennial Forbs		743	465	343	341	222	155	2.71	4.48
Total for Forbs		743	480	344	341	228	156	2.74	4.51

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 16B, Study no: 20

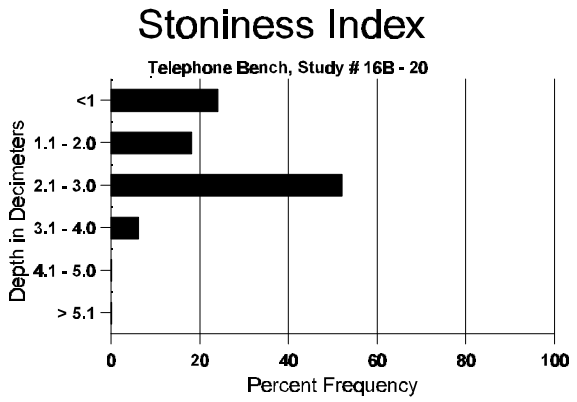
Type	Species	Strip Frequency '94	Strip Frequency '99	Average Cover % '94	Average Cover % '99
B	Amelanchier utahensis	9	10	.56	.38
B	Artemisia nova	94	96	5.24	7.77
B	Artemisia tridentata vaseyana	8	12	.83	.03
B	Chrysothamnus depressus	84	80	2.48	4.32
B	Chrysothamnus nauseosus nauseosus	0	0	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	48	38	.90	.66
B	Eriogonum corymbosum	3	5	.03	.09
B	Gutierrezia sarothrae	54	68	1.54	1.50
B	Opuntia spp.	2	0	.00	-
B	Pediocactus simpsonii	1	1	.01	-
B	Sambucus cerulea	0	0	-	-
B	Tetradymia canescens	2	5	-	.00
Total for Browse		305	315	11.61	14.75

BASIC COVER --
Herd unit 16B, Study no: 20

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '88	Average Cover % '94	Average Cover % '99
Vegetation	344	345	14.00	32.61	37.92
Rock	107	59	4.25	2.26	1.97
Pavement	148	95	1.00	.54	.61
Litter	395	365	42.00	42.15	24.82
Cryptogams	142	176	3.75	4.62	6.30
Bare Ground	350	317	35.00	34.70	31.67

SOIL ANALYSIS DATA --
Herd Unit 16B, Study # 20, Study Name: Telephone Bench

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
11.2	54.8 (12.4)	7.4	38.4	29.8	31.8	1.7	5.7	83.2	0.5



PELLET GROUP DATA --
Herd unit 16B, Study no: 20

Type	Quadrat Frequency '94	Quadrat Frequency '99
Sheep	-	1
Rabbit	20	6
Elk	51	37
Deer	18	16
Cattle	0	0

Pellet Transect Days Use/Acre (ha) '99
0
n/a
179 (442)
19 (47)
1 (2)

BROWSE CHARACTERISTICS --
Herd unit 16B, Study no: 20

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
S	88	-	-	-	1	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	88	1	2	4	-	-	-	-	-	-	7	-	-	-	466			7
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	3	-	-	-	-	-	-	-	3	-	-	-	60			3
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	3	4	1	-	-	1	-	-	-	9	-	-	-	180	63	88	9
	99	-	-	6	-	-	1	-	-	-	7	-	-	-	140	24	28	7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	29%	57%	00%	-61%
'94	44%	22%	00%	+10%
'99	30%	70%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	466	Dec:	-
	'94	180		-
	'99	200		-

Artemisia nova																		
S	88	35	-	-	1	-	-	-	-	-	36	-	-	-	2400			36
	94	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	99	73	-	-	-	-	-	-	-	-	73	-	-	-	1460			73
Y	88	28	-	-	-	-	-	-	-	-	28	-	-	-	1866			28
	94	22	23	-	-	-	-	-	-	-	45	-	-	-	900			45
	99	50	1	3	-	-	-	-	-	-	54	-	-	-	1080			54
M	88	26	3	-	-	-	-	-	-	-	27	-	2	-	1933	10	12	29
	94	69	31	3	1	-	-	-	-	-	100	-	-	4	2080	9	14	104
	99	78	119	41	-	-	-	-	-	-	236	-	2	-	4760	8	16	238
D	88	38	8	-	1	-	-	-	-	-	39	-	4	4	3133			47
	94	119	58	1	-	5	-	2	-	-	75	-	-	110	3700			185
	99	24	17	6	-	-	3	-	-	-	43	-	-	7	1000			50
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	1920			96
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	1580			79

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	11%	00%	10%	- 4%
'94	35%	01%	34%	+ 2%
'99	40%	15%	03%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	6932	Dec:	45%
	'94	6680		55%
	'99	6840		15%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
Y	88	2	1	-	-	-	-	-	-	-	3	-	-	-	200			3
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	88	-	-	2	-	-	-	-	-	-	2	-	-	-	133	11	12	2
	94	2	4	-	-	-	-	-	-	-	6	-	-	-	120	18	21	6
	99	2	8	3	-	-	-	-	-	-	13	-	-	-	260	14	19	13
D	88	-	-	2	-	-	-	-	-	-	2	-	-	-	133			2
	94	-	3	-	-	-	-	-	-	-	2	-	-	1	60			3
	99	-	-	2	-	1	-	-	-	-	1	-	-	2	60			3
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	260			13

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	14%	57%	00%	-61%
'94	78%	00%	11%	+50%
'99	50%	28%	11%	

Total Plants/Acre (excluding Dead & Seedlings)				
'88	466	Dec:		29%
'94	180			33%
'99	360			17%

Chrysothamnus depressus																		
S	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	34	-	-	-	-	-	-	-	-	34	-	-	-	680			34
Y	88	33	-	-	-	-	-	-	-	-	32	-	1	-	2200			33
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	16	-	-	-	-	-	-	-	-	15	-	-	-	320			16
M	88	40	1	1	-	-	-	-	-	-	41	-	1	-	2800	5	7	42
	94	301	-	-	-	-	-	-	-	-	301	-	-	-	6020	4	8	301
	99	232	60	-	-	-	-	-	-	-	292	-	-	-	5880	4	10	294
D	88	2	-	-	-	-	-	-	-	-	1	-	-	1	133			2
	94	4	-	-	-	-	-	-	-	-	3	-	-	1	80			4
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	120			6
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	01%	01%	04%	+16%
'94	00%	00%	.32%	+ 2%
'99	19%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'88	5133	Dec:		3%
'94	6140			1%
'99	6260			1%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus nauseosus																		
D	88	-	-	1	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	100%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	66	Dec:	100%
	'94	0		0%
	'99	0		0%

Chrysothamnus viscidiflorus viscidiflorus																		
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	29	-	-	-	-	-	-	-	-	29	-	-	-	1933			29
	94	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	88	50	2	-	-	-	-	1	-	-	53	-	-	-	3533	4	6	53
	94	121	-	-	-	-	-	-	-	-	121	-	-	-	2420	4	10	121
	99	78	1	-	-	-	-	-	-	-	79	-	-	-	1580	5	10	79
D	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	02%	00%	00%	-55%
'94	00%	00%	00%	-37%
'99	01%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	5599	Dec:	2%
	'94	2520		1%
	'99	1600		0%

Eriogonum corymbosum																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	2	1	-	-	-	-	-	-	-	3	-	-	-	60	13	27	3
	99	8	1	-	-	-	-	-	-	-	9	-	-	-	180	10	18	9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'94	33%	00%	00%	+67%
'99	11%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'94	60		-
	'99	180		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
Y	88	5	-	-	-	-	-	1	-	-	6	-	-	-	400			6
	94	25	-	-	-	-	-	-	-	-	25	-	-	-	500			25
	99	22	-	-	-	-	-	-	-	-	22	-	-	-	440			22
M	88	6	-	-	-	-	-	-	-	-	6	-	-	-	400	5	4	6
	94	114	-	-	-	-	-	-	-	-	82	-	-	-	2280	5	6	114
	99	275	-	-	-	-	-	-	-	-	275	-	-	-	5500	6	7	275
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	15	-	-	-	-	-	-	-	-	3	-	-	1	300			15
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	+74%
'94	00%	00%	.64%	+48%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	800	Dec:	0%
	'94	3080		10%
	'99	5940		0%

Opuntia spp.																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	2	7	1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'94	40		-
	'99	0		-

Pediocactus simpsonii																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
	99	-	-	1	-	-	-	-	-	-	1	-	-	-	20	6	3	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'94	00%	00%	00%	+ 0%
'99	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'94	20		-
	'99	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Sambucus cerulea																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	11	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'88	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'94	0		-
	'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Tetradymia canescens																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	88	-	1	-	-	-	-	-	-	-	1	-	-	-	66	12	16	1
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40	11	14	2
	99	3	1	-	-	-	-	-	-	-	4	-	-	-	80	8	16	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	100%	00%	00%	-39%
'94	00%	00%	00%	+60%
'99	20%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	66	Dec:	-
	'94	40		-
	'99	100		-